

VESSELS TOWING EQUIPMENT

Accident Prevention Plan:

If we review the history of DOI vessels involved in towing equipment, in many instances scientific gear, we must conclude that accidents will continue to occur unless we take substantial and positive measures to change the manner in which this type of activity is conducted. If you intend to operate a vessel while towing some type of equipment you must insure that the following actions are implemented in order to avoid vessel accidents in the future.

- **HAZARD ANALYSIS:** Any of our employees who are planning to conduct any vessel operations that will involve the towing of equipment on a routine basis must be required to perform a hazard analysis before any work involving a vessel towing equipment is accomplished and include the following modifications to their vessels and equipment.
- **WEAK LINK/FREE SPOOL:** Any vessel involved in these types of activities must be equipped with a method to rapidly detach from any towed gear. From the analysis of the accidents this is the most important factor and must be employed. One fact that becomes clear and is undeniable is that the crew can not expect to have an adequate amount of time to react before the boat is in a critical position. Whatever method is used to protect the boat from this type accident it must be something that can be deployed in split seconds. Line cutting devices are fine but better than that is a “weak link” in the line and or a “drag” system on the winch that allows the winch to “free spool” line in the case of a hang up without operator control. Employing both is probably the best system. If you are trying to protect the crew and vessel from a potentially fatal accident it is worth having a system with built in redundancy. “You should always have a back up plan.” The USGS has developed winches on their vessels that include a “weak link” that will break if the winch spools out all of the line before the crew can free the equipment.
- **CLOTH LINE NOT CABLE:** Rather than using cable to attach the gear, vessels should be equipped with some type of line making it easier to cut. In most instances the gear we are towing is not exerting such a force that only cable will suffice to support the load.
- **PLAN TO SACRIFICE YOUR GEAR NOT YOUR LIFE:** The crew of the vessel must be prepared to sacrifice their towed equipment. Knowing that, you should design a system that allows you to detach from the equipment and return later, locate and retrieve the gear, e.g. constant GPS locations, painters or lines trailed off of the equipment, possibly with a float attached. The writer cannot design the system. But what can be predicted is that crews involved in towing equipment will, given time, most likely have to abandon that equipment to save the crew and vessel. If our crews begin their analysis based on that predicate then they can design a system for their specific project that should

keep them and their vessel safe. Therefore make plans to abandon your gear, and retrieve it after the threat has passed.

- **REDUNDANCY:** All crews involved in these types of activities must employ these measures in this priority; a “weak link”, of some type, a passive “drag” system on the winches, preferably lines rather than cable and an effective cutting device immediately available.
- **VESSEL STABILITY:** If possible attach the equipment to the bow or at least forward of amidships on the beam. If equipment is suspended from the gunwale take measures to maintain even ballast. An inherent part of this discussion is vessel stability. When employees decide that they must tow gear there must be significant thought given to the vessels overall stability, e.g. load, righting arm, and symmetry. Those factors all contribute to the vessels ability to maneuver. In an emergency the vessels ability to maneuver is often the most important factor insuring its survival.
- **ATTACHMENT HEIGHT:** The line supporting the towed equipment should **never** enter the water higher than the gunwale of the vessel. Design modifications should be taken when possible to have the final attachment point as close to the surface of the water as possible.
- **AVOID TOWING EQUIPMENT DOWN CURRENT:** Our crews should avoid towing equipment down current if possible. When a vessel is moving down current it must increase its speed relative to the speed of the water in order to maintain maneuverability. That extra speed compounds the risk to crew and vessel if the towed gear becomes fouled on the bottom. If a vessel must tow down current it should be a requirement that they will have a reliable tested “weak link” in their attachment to the gear that will release the vessel in case of a hang up in addition to other methods of releasing the gear, e.g. a “free spool” device on the winch, cloth line not cable and a cutting device immediately available.
- **PFD – PFD – PFD:** The single most important action an operator or crew member can take to increase their personal safety when they board a vessel is to don a PFD. Yet we continue to see personnel refusing to use that safety equipment. The fatality that occurred in the Hudson River incident was most likely the direct result of that individual not wearing a PFD. If that is not the case it certainly was a significant contributing factor to that death. However a point to consider is, if crew members are working inside closed spaces on the vessel those crewmembers should not wear PFDs with more floatation than a Type III. The reason for this is that, if the vessel capsizes a victim in a higher class PFD with more floatation may have significant problems extricating themselves from the closed space or cabin. However the risk of being trapped does not outweigh the risk of not wearing a PFD. The single most important action the operator of a vessel can do to

insure the safety of their crew is to demand that each crewmember will wear at all times a proper PFD.

- **DESIGN REVIEW:** When ordering or modifying vessels employees must not assume that the vessel manufacturer fully understands the forces that the vessel and gear will be subjected to. It is imperative that the manufacturer be fully informed of what the vessel will be used for and the exact reason for any modification made in the design. Within the Service and DOI there are vessels conducting all types of towing activities that have integrated effective and safe design changes for those purposes. Before you design a system to accommodate the particular equipment/activity you intend to conduct contact your Regional Watercraft Safety Coordinator or NCTC and determine what functional designs are available.